National Institute of Environmental Health Sciences

Influence of warming tendency on Culex pipiens population abundance and on the probability of West Nile fever outbreaks (Israeli case study: 2001-2005)

Author(s): Paz S, Albersheim I
Year: 2008
Journal: Ecohealth. 5 (1): 40-48

Abstract:

Climate change and West Nile fever (WNV) are both subjects of global importance. Many mosquitoes and the diseases they carry, including West Nile virus (WNV), are sensitive to temperature increase. The current study analyzes the lag correlations between weather conditions (especially air temperature) and 1) Culex pipiens mosquito population abundance, and 2) WNF frequency in humans, between 2001 and 2005 in Israel. These 5 years follow a long period with a documented tendency for temperature increase in the hot season in the country. Monthly anomalies of minimum and maximum temperatures, relative seasonal rainfall contribution, mosquito samplings (hazard level), and WNF cases (hospital admission dates and patients' addresses) were analyzed. Logistic regression was calculated between the climatic data and the mosquito samples, as Spearman correlations and Pearson cross-correlations were calculated between daily temperature values (or daily precipitation amounts) and the hospital admission dates. It was found that the disease appearance reflects the population distribution, while the risk tends to escalate around the metropolis characterized by an urban heat island. Positive anomalies of the temperature during the study period appear to have facilitated the mosquito abundance and, consequently, the disease emergence in humans. An important finding is the potential influence of extreme heat in the early spring on the vector population increase and on the disease's appearance weeks later. Awareness of such situations at the beginning of the spring may help authorities to reduce the disease risk before it becomes a real danger. © 2008 International Association for Ecology and Health.

Source: http://dx.doi.org/10.1007/s10393-007-0150-0

Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified, Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Israel

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: West Nile Virus

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content